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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/873,674	06/04/2001	Zoran Krivokapic	F0537	5266

7590

07/31/2002

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EXAMINER

FENTY, JESSE A

ART UNIT

PAPER NUMBER

2815

DATE MAILED: 07/31/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/873,674

Applicant(s)

KRIVOKAPIC, ZORAN

Examiner

Jesse A. Fenty

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 25 June 2002.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) 15-20 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-14 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1. Applicant's election of Group I, claims 1-14 in Paper No. 4 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

2. Claims 15-20 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention, there being no allowable generic or linking claim.

Election was made **without** traverse in Paper No. 4.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 1-14 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

a. In re claim 1, the functional limitations regarding the ON and OFF states of the device are vague and indefinite. Applicant gives no positive limitations regarding how or why the device will function in different manners for differing states. Simply stating claim language in such a way does not distinguish the structure of the claimed device to what is known in the prior art.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 1 and 2, as best understood, are rejected under 35 U.S.C. 102(b) as being anticipated by Beyer et al. (U.S. Patent No. 5,962,895).

In re claim 1, Beyer discloses a semiconductor device on an insulating substrate, comprising:

A first gate (140) defining a first channel region interposed between a source (116) and a drain (114) formed within the active region of the insulating substrate;

A second gate (110) straddling the first gate defining second channel regions interposed between the first channel region and the source and the drain; and

A contact (205) connecting the first gate with the second gate wherein when the device is in the off state the first channel region and second channel regions define a long channel and when the device is in the on state the first channel region defines a short channel.

In re claim 2, Beyer discloses the device of claim 1, wherein the first gate (doped polysilicon) defines a work function and the second gate (non-doped polysilicon) defines a second work function.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claim 3, as best understood, is rejected under 35 U.S.C. 103(a) as being unpatentable over Beyer et al. as applied to claim 2 above, and further in view of Lee (U.S. Patent No. 5,164,805).

In re claim 3, Beyer discloses the device of claim 2, but does not expressly disclose the numerical work functions of the gate regions. Lee discloses the use of tungsten for sub-micron semiconductor devices with corresponding numerical work functions (column 4, lines 12-16). It would have been obvious for one skilled in the art at the time of the invention to substitute tungsten as disclosed by Lee for the doped polysilicon layer of Beyer for the purpose, for example, of decreasing the resistivity of that gate region (Lee; column 4, lines 2-10).

9. Claim 4, as best understood, is rejected under 35 U.S.C. 103(a) as being unpatentable over Beyer et al. as applied to claim 1 above, and further in view of Hwang (U.S. Patent No. 5,567,966).

In re claim 4, Beyer discloses the device of claim 1, but does not expressly disclose the source and drain regions having source and drain extension regions. Hwang discloses an SOI device with source/drain and source/drain extension regions. It would have been obvious for one skilled in the art at the time of the invention to outfit the device of Beyer with source/drain

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extension regions as disclosed by Hwang for the purpose, for example, of improving the drain to source breakdown of the device (Hwang; column 2, lines 39-41)

10. Claims 5-8, as best understood, are rejected under 35 U.S.C. 103(a) as being unpatentable over Beyer et al. as applied to claim 1 above, and further in view of Chau et al. (U.S. Patent No. 5,625,217).

In re claims 5 and 7, Beyer discloses the device of claim 1, but does not expressly disclose silicide regions disposed over the source, drain and gate regions. Chau discloses silicide regions disposed over source, drain and gate regions. It would have been obvious for one skilled in the art at the time of the invention to form silicide regions over said regions to for the well known reasons of enhancing the conductivity of said regions.

In re claims 6 and 8, Beyer in view of Chau discloses the devices of claims 5 and 7 respectively, but does not expressly disclose the thickness of the silicide regions to be in the range of 100 to 400 angstroms, rather a higher order of thickness based on the proportional thickness of the device. Thicknesses of silicide layers such as these vary depending on the scale of the device and it would have been obvious to one skilled in the art at the time of the invention to determine the optimum thickness of the silicide layer since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

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11. Claim 10, as best understood, is rejected under 35 U.S.C. 103(a) as being unpatentable over Beyer et al. as applied to claim 1 above, and further in view of Ju (U.S. Patent No. 6,424,009 B1).

In re claim 10, Beyer discloses the device of claim 1, but does not expressly disclose the SOI substrate to be a GOI substrate. Ju discloses a device similar to that of the claimed invention with the option of being made on a GOI substrate. It would have been obvious for one skilled in the art at the time of the invention to construct the device of Beyer on a GOI substrate as disclosed by Ju for the purpose, for example, of forming a second structure to cut down on leaky thermally conductive insulating layers (Ju; column 6, lines 20-24)

12. Claims 11-13, as best understood, are rejected under 35 U.S.C. 103(a) as being unpatentable over Beyer et al. in view of Ju as applied to claim 10 above, and further in view of Chau et al. (as above).

In re claims 11-13, Beyer in view of Ju discloses the device of claim 10, but does not expressly disclose silicide layers atop the source, drain, and gate layers and the thicknesses of those layers. Chau discloses silicide regions disposed over source, drain and gate regions. It would have been obvious for one skilled in the art at the time of the invention to form silicide regions over said regions to for the well known reasons of enhancing the conductivity of said regions.

Secondly, thicknesses of silicide layers such as these vary depending on the scale of the device and it would have been obvious to one skilled in the art at the time of the invention to determine the optimum thickness of the silicide layer since it has been held that where the

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general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

Conclusion

13. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Bryant et al. (U.S. Patent No. 6,300,657 B1); Inoue et al. (U.S. Patent No. 5,283,455); Yamanaka (U.S. Patent No. 5,834,797); Choi et al. (U.S. Patent No. 5,621,236); Mandelman et al. (U.S. Patent No. 6,097,070); Krivokapic (U.S. Patent No. 6,380,589 B1); Tseng et al. (U.S. Patent No. 6,043,545); Yamaguchi (U.S. Patent No. 6,373,668); Imai (U.S. Patent No. 6,344,675 B1); and Kim (U.S. Patent No. 5,693,549) disclose similar structures and components as that claimed in the present application

14.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jesse A. Fenty whose telephone number is 703-308-8137. The examiner can normally be reached on 5/4-9 1st Fri. Off.

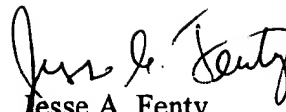
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eddie Lee can be reached on 703-308-1690. The fax phone numbers for the organization where this application or proceeding is assigned are 703-308-7722 for regular communications and 703-746-3892 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

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Jesse A. Fenty
Examiner
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JAF

July 29, 2002